

WHAT IS CLAIMED IS:

1. A method of hardfacing a workpiece comprising the steps of:
depositing a hardfacing material on a workpiece at a temperature high enough to create a molten puddle of the hardfacing material on the workpiece, and
introducing hardening pellets into the molten puddle on the workpiece while moving the workpiece, the hardening pellets being introduced into the molten puddle from a location remote from the point at which the hardfacing material is deposited on the workpiece, either the spacing between the point at which the hardfacing material is deposited onto the workpiece or the rate of movement of the workpiece being adjusted so that the hardfacing material remains molten until the hardfacing material is introduced into the molten puddle of hardfacing material.
2. The method of claim 1 wherein the pellets are introduced into the molten puddle by injection.
3. The method of either claims 1 or 2 wherein the pellets are cooled before being introduced into the molten puddle.
4. The method of either claims 1 or 2 wherein the pellets are comprised of a material selected from the group consisting of steel, tungsten, chrome carbide, tungsten carbide, and ceramic tungsten.
5. The method of claim 1 wherein the pellets are comprised of tungsten that melts at a temperature greater than about 1800°F.
6. The method of claim 1 wherein the pellets are comprised of an amorphous material.
7. The method of claim 1 additionally comprising introducing pellets into the molten puddle at a second location remote from the point at which the hardfacing material is deposited on the workpiece.
8. The method of claim 7 wherein the pellets introduced into the molten puddle at a second location are of different size, shape, or composition than the pellets introduced into the molten puddle at the first location.

9. A hardfaced workpiece produced by the process of any of the preceding claims.
10. Apparatus for hardfacing a workpiece comprising:
 - means for moving a workpiece to be hardfaced;
 - a deposition head positioned relative to the workpiece for depositing a molten pool of hardfacing material on the workpiece; and
 - a pellet metering device positioned remote from said deposition head for introducing hardening pellets into the molten pool of hardfacing material as the workpiece is moved.
11. The apparatus of claim 10 wherein said workpiece moving means moves the workpiece at a controlled rate, the rate of movement being selected to insure that the pellets penetrate down into the molten pool of hardfacing material.
12. The apparatus of either of claims 10 or 11 additionally comprising means for changing the position of said deposition head, said pellet metering device, or both said deposition head and said pellet metering device, relative to the workpiece, relative to each other, or both relative to the workpiece and each other.
13. The apparatus of any of claims 10 – 12 additionally comprising means for injecting the pellets into the molten pool of hardfacing material.
14. The apparatus of any of claims 10 – 13 additionally comprising means for cooling the pellets.
15. The apparatus of any of claims 10 – 13 additionally comprising means for controlling the rate, volume, or rate and volume of pellets introduced into the molten pool.